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## REMARKS

### *Status of the Application:*

Claims 1–51 are the claims of record of the application. Claims 7–42 have been withdrawn, and claims 1–6 and 43–51 are the claims elected for examination.

### *Claim Rejections - 35 USC 112*

In paragraph 4 of the office Action, claims 1–6, and 43–50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Regarding claim 1, lines 4–5, the Examiner asserts that the limitation "a series of audio inputs representing audio inputs being projected from an idealized speaker located at a spatial location relative to an idealized listener" fails to correctly described the invention as shown in Fig. 1. The audio signals are being projected by more than one idealized speaker. As shown in Fig. 1, there are two idealized speakers located at two spatial locations.

While the Applicants do not agree that one in the art would see an ambiguity in the way the claim is written, in the interest of progressing the prosecution of the Application, Applicants have amended (a) of claim 1 to state that there is a series of audio inputs representing audio signals each being projected from an idealized speaker located at a respective spatial location relative to an idealized listener.

The rejection under 35 USC 112 is believed overcome.

### *Claim Rejections - 35 USC 102*

In paragraph 6 of the Office Action, claims 1–4, 47 and 49–51 are rejected under 35 U.S.C. 102(e) as being anticipated by Cashlon et al (US 5,809,149), hereafter "Cashlon."

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**Cashion vs. the present invention**

Cashion shows in FIGS. 2A and 2B a system that takes a single audio input 30, or input 30 and additional inputs 30' (see discussion below) and generates, in FIG. 2A, *from each single audio input* left and right front signals (from 110 and 112), left and right rear signals (from 114 and 116), left and right front signals (from 126 and 128), and left and right early rear signals (from 130, 132), the early signals from respective front and rear early reflection filters 88, 90 and 92, 94. See col. 7, lines 7 to col. 8, line 24 of Cashion. Cashion also accepts a position signal 35 from a video game and generates range control and azimuth control signals 39 and 58 processed in the front end 32 and next level 34. The purpose of the units 32 and 34 are to produce front and rear panning to give a listener the impression that the single sound 30 is coming from a particular azimuth and range. Delay buffers provide range, and weighting of the signal to produce different amounts of left and right for each of the front and rear stereo pair, and for early reflections.

It would be clear to one in the art that the purpose of the processing of unit 32 and the processing of 34 is to take a *single audio input* and produce from it left and right front, and left and right rear signals. These are then processed to produce signals for playback through headphones by the processing shown in FIG. 2B.

It is therefore not the purpose of FIG. 2A of Cashion to start with a series of stereo inputs, or a series of surround sound signals, e.g., AC-3 signals, to produce signals for playback through headphones, as asserted by the Examiner in her rejections.

**The rejections in detail:**

**Regarding independent claim 51**, this claim has been amended to more clearly point out that the accepting of a plurality of input signals representing sound sources, and that the input signals are one of either a stereo pair of left and right audio signals, Dolby AC-3 inputs; a surround sound plurality of inputs including

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front left, front right, rear left, and rear right audio signals. The claim has also been amended to clearly state that the sound sources include at least one frontal sound portion. The claim has also been amended to state that the reverberant part of the acoustic response produced by the processing is weighted only toward the front of the listener.

As explained above in the brief description of Cashlon, and upon reading Cashlon, it would be clear to one in the art that the purpose of the processing of unit 32 and the processing of 34 is to take a **single audio input** and produce from it left and right front, and left and right rear signals. These are then processed to produce signals for playback through headphones by the processing shown in FIG. 2B.

It is therefore not the purpose of FIG. 2A of Cashlon to start with a set of stereo inputs, or a set of surround sound signals, e.g., AC-3 signals, to produce signals for playback through headphones.

Cashlon does not disclose input signals representing sounds that include at least one frontal sound portion. In fact, there is only one signal (30), or more signals (31'). Only control of one signal is described, and its position is located by the range and azimuth controller. That input 30's position—the position of the whole signal—can be manipulated to be from the front, e.g., by controlling the range control in unit 36.

Thus, claim 51, as amended, is believed allowable over Cashlon. Allowance is respectfully requested.

**Regarding claim 1**, the Applicants have amended the claim to state that the series of audio inputs are one either a stereo pair of left and right audio signals, Dolby AC-3 inputs; a surround sound plurality of inputs including front left, front right, rear left, and rear right audio signals. Only for the purpose of progressing prosecution, the Applicants have also amended element (c) to more clearly state

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that the filtered intermediate output signals include filtered direct response signals, filtered short time response signals, and filtered reverberant signals.

As explained above in the brief description of Cashion, and upon reading Cashion, it would be clear to one in the art that the purpose of the processing of unit 32 and the processing of 34 is to take a *single audio input* and produce from it left and right front, and left and right rear signals. These are then processed to produce signals for playback through headphones by the processing shown in FIG. 2B.

Cashion is for the purpose of accepting a signal 35 from a video game indicative of azimuth and range of an audio signal (30).

It is therefore not the purpose of FIG. 2A of Cashion to start with a series of stereo inputs, or a series of surround sound signals, e.g., AC-3 signals, to produce signals for playback through headphones, as asserted by the Examiner in her rejections.

Note that in paragraph 9, the examiner rejected claims 5 and 6 under 35 U.S.C. 103(a) as being obvious over Cashion in view of Tanner, Jr. et al (US 6,307,941). Claims 5 and 6 deal with AC-3 and stereo inputs.

The examiner admits Cashion fails to show the audio inputs comprise Dolby AC-3 inputs or stereo inputs, but asserts that because Cashion teaches a "general sound processing circuit" for processing a general audio source without specifying the nature of the input signals as in any specific format. The examiner then states that one skilled in the art would have expected that the concept taught in Cashion would work equally well for audio signals compressed in specific format, such as Dolby AC-3 format. This is not so. From examination of FIGS. 2A and 2B, as explained above, much of Cashion's processing is to generate the stereo or surround sound signals. Therefore, one cannot simply substitute such signals for the single input 30 or for 30' of Cashion.

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Now note that Cashion's filters 46 and 48 filter a combination of theft and front signals from 110 and 112, and a *sum* of the short time response signals, and filtered reverberant signals (from filers 88, 90, 92, 94, and 96, 98). Furthermore, the Examiner asserts that Cashion discloses in FIG. 2B, a second mixing matrix means (170, 172) combining said filtered intermediate output signals to produce left and right channel stereo outputs. Units 170 and 172 combine the direct

Therefore, claim 1, as amended is not disclosed or suggested by Cashion, and claim 1, as amended, is allowable over Cashion.

Claims 2–6 and 43–50 depend on claim 1, and are therefore also allowable. Allowance thereof is respectfully requested.

Note that even though the independent claims are not disclosed or suggested by Cashion, the same is true of some of the features of the dependent claims. For example:

**Regarding claim 3**, the Examiner asserts that Cashion shows the first matrix means applying a time varying gain to the audio inputs (30, 30'), e.g., that Cashion discloses that the gain to multipliers in 32 and 34 is changed according to the position changed in time in order to simulating the moving sound source in time. The Applicants cannot find any such reference to time varying the gains of scalars 32 and 34. Thus, the Examiner has failed to show that claim 3 is unpatentable over Cashion, even if claim 1 was unpatentable over Cashion.

**Regarding claim 49**, the examiner asserts that Cashion shows that said apparatus further comprises a variable zoom control adapted to alter said filter coefficients in accordance with a control setting so as to alter a perceived distance of the sound source response. Cashion has a range control that changes the delay of delay elements as shown in FIG. 2A, and in the text. There is no zoom control adapted to alter any filter coefficients. Thus, the Examiner has failed to

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show that claim 3 is unpatentable over Cashion, even if claim 1 was unpatentable over Cashion.

*Claim Rejections - 35 USC 103*

In paragraph 9 of the Office Action, the Examiner asserts that claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cashion in view of Tanner, Jr. et al (US 6,307,941), hereinafter Tanner.

Claims 5 and 6 are dependent on claim 1 which has been argued to be allowable. However, the examiner has failed to shown claims 5 and 6 are unpatentable. As agued above, Cashion is for processing a single input, or a set of independent inputs for generating a sensation that the signal is at an azimuth and range according to an input from a video game.

In Paragraph 10 of the Office Action, claim 43 was rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizume et al (US 6,269,061) in view of Cashion.

Claim 43 is dependent on claim 1 which has been argued to be allowable. However, claim 43 would even be allowable if claim 1 was not.

Cashion describes a video game player. Skip protection is associated with portable video players that are for music. There would be no motivation to add skip protection to a video game player, and indeed, Cashion does not describe any problem with skip. Similarly, Shimizume et al does not combine the disclosed invention with the sound spatialization system of Cashion. In fact, Cashion is not for playback of music, but rather for localizing a sound from a video game. The word "game" for example does not appear in Shimizume et al.

Therefore, Claim 43 would be allowable even if claim 1 on which it depends was not allowable.

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In Paragraph 10 of the Office Action, the examiner has rejected claims 44-46 and 48 were rejected under 35 U.S.C. 103(a) as being unpatentable over Cashion in view of Lee (US 5,590,204).

Lee indeed discloses an audio signal processing system. As argued above, Cashion, however, does not disclose a system for the playback of stereo or surround sound signals, but rather for localizing in range and azimuth a sound source as would occur in a video game. Therefore, there is no motivation to add the teaching of Cashion with that of Lee. Indeed, Lee already includes spatialization, e.g., the processing of surround sound signals for playback through two channels, so there would be no motivation for one in the art to combine the teachings of Lee to that of Cashion, for Cashion would not add anything the Lee required for playback.

Therefore, the examiner has failed to show that claims 44, 46 and 48 are unpatentable over Cashion in view of Lee (US 5,590,204), even if their base claim, claim 1 was unpatentable.

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Therefore, all the claims, as amended, are now allowable. Allowance thereof is respectfully requested.

If the Examiner has any questions or comments that would advance the prosecution and allowance of this application, an email message to the undersigned at dov@inventek.com, or a telephone call to the undersigned at +1-510-547-3378 is requested.

Respectfully Submitted,

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Date

  
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